MasterStrength BAR

Pultruded Carbon Fibre Rod for structural strengthening and Retrofitting Applications

Material Description

MasterStrength BAR is a ready to use pultruded carbon fibre rod, which provides a high tensile strength (that is higher than steel reinforcement used in the concrete industry) and can be used for flexural reinforcement of concrete, masonry and timber elements. MasterStrength BAR system is in compliance with AS 5100.8: 2017 as Type CR.

Areas of Application

To replace or augment steel reinforcement in concrete structures. To add reinforcement to timber and masonry elements. Suitable for NSM (near surface mounted reinforcement) of structures.

- Ideal when the cover of the steel bars is very low, as MasterStrength BAR does not corrode.
- Can be used for slim or narrow architectural concrete.
- Reduce deformation under working loads (increase in rigidity)
- Increase the load-bearing capacity (e.g. structural conversion following a change in capacity load)
- Increase the fatigue strength
- Improve the performance of cracked structures (increase in durability)
- MasterStrength BAR is supplied with peel ply, which gives better protection during handling and improved adhesion to the substrate. There are also none peel ply option available upon request.
- Can be buried in the structure
- Ideal for use in historical structures
- MasterStrength BAR enables the amount of reinforcement to be calculated in relation to the performance required or the stress flow
- Allows faster installation, thereby reducing costs
- Increases the durability of the structure by protecting it against the aggressive action of chlorides and freezing and thawing cycles

Performance Data

Performance Properties	AS 5100.8 A2.2.1 Type CR	MasterStrength BAR [dia] CR with peel ply	MasterStrength BAR [dia] CR NP (Non- peel ply)
Tensile Strength	2200MPa	Mean 2500 Min 2200	Min 2600
Tensile Modulus	140GPa	Mean165 GPa Min 156GPa	Min 150GPa
Ultimate elongation(strain)	1.3%	Mean 1.5% Min 1.3%	Max.1.8%
Fibre content %	65%	70±3	68-72
Density g/cm^3		1.60±0.1	Min. 1.8
Glass transition temperature	70°C	>80°C	>80°C
Diameter mm with peel ply		8, 10, 12,	
Diameter mm without peel ply		7.7, 9.7, 11.7	8, 10, 12

Note: Values given in the Performance Data table are minimum values obtained from regular, quality assurance testing. Some variation may occur dependent on batch, size, and test method sensitivity. Allowance should be made for this in the design process. The structural designer is advised to satisfy themselves, by prior testing if necessary, that the grade chosen will conform to the performance criteria for their specific design requirements.

Application

For detailed instructions, refer to the "Fibre Reinforced Polymer Composite Strengthening MasterStrength systems" document.

Under normal conditions, preparation of surfaces for NSM Bars requires cutting groove/slot into the surface according to the depth and widths indicated on the table below.

BAR Dia	Groove width x Depth mm	MasterStrength 4000 yield (1x5kg kit/Lm of FRP)
8	14x14	20m
10	16x16	16m
12	18x18	13m

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Depth and width of groove should be greater than 1.5 x diameter or width of rod or bar.
Check that no reinforcement or other structural elements will be cut or compromised.
Thoroughly clean the slot prior to application. The surfaces to be strengthened with **MasterStrength BAR** should be prepared adequately to receive to the **MasterStrength BAR.**
A coat of **MasterStrength PRI 3500** may be required on porous substrates.
Mix the **MasterStrength 4000** as directed. Apply the adhesive to the prepared chase and place the **MasterStrength BAR** into the adhesive. Level the adhesive to ensure that a smooth surface is achieved.
The adhesive normally used for **MasterStrength BAR** is the **MasterStrength 4000**, a two component epoxy based adhesive. Refer to separate technical data sheet for technical properties. Depending on the application, other Master Buiders Solutions adhesives may be used to suit a variety of installation conditions (eg **MasterStrength 1444** or **MasterStrength 2525**). Please contact your local Master Buiders Solutions Technical Sales Representative for further information.

Packaging

MasterStrength BARs are delivered with a specific pre-cut length (typically 11.8). This specific Length is due to maximum size can be delivered in a container.

Other customised length can be cut based on project specific details.

Watchpoints

Design and detailed specification should be carried out by appropriately qualified and competent person(s). Trained and experienced specialist contractors should only carry out installation. Site quality control should be the responsibility of an independent organisation appointed by the client or his representatives.Technical details of other adhesives, primers and coatings can be found on the technical data sheets for the respective products.

Specification Clause

Ready to use pultruded carbon fibre rod, which provides a high tensile strength and complying with Type CR in table A2.2.1 of AS 5100.8: 2017; to replace or augment steel reinforcement in concrete structures or to add reinforcement to timber and masonry elements.

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Disclaimer

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